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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/583,059

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EXAMINER

VALENROD, YEVGENY

ART UNIT

PAPER NUMBER

1621

MAIL DATE

DELIVERY MODE

02/03/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/583,059	Applicant(s) HAAN ET AL.	
	Examiner YEVEGENY VALENROD	Art Unit 1621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 November 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The following is a final office action in application # 10/583,059. This application has been reassigned to Examiner Valenrod whose contact information is provided as the end of the instant document.

Applicants' remarks filed 11/12/08 and 4/24/08 have been considered. Applicants' arguments are found insufficient to overcome rejection of record. The text of the said rejection is repeated below followed by Examiners reply to applicants' remarks.

Claim Rejections – 35 USC 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kummer et al. (US 4,777,285).

The instant claims are drawn to the preparation of an alkyl alkenoate, by reacting a lactone and an alkyl alcohol with a strong acid catalyst and operating under continuous distillation.

Kummer et al. teaches preparation of an alkyl alkenoate, by reacting a lactone and an alkyl alcohol with a strong acid catalyst in which the reaction can be continuous

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(column 2, lines 4-5), the reaction mixture is distilled and the lactone is recycled to the reaction (column 2, lines 54-56).

Kummer et al. is deficient in that it does not explicitly teach continuous distillation, the molar ratio of the lactone to the alkanol, and gamma valerolactone, which is one CH₂ group from Applicant's claimed compound.

In reference Applicant's limitations for continuous distillation and the molar ratio of the lactone to the alkanol, it is the position of the Examiner that one of ordinary skill in the art, at the time of the invention, would through routine and normal experimentation determine the optimization of these limitations to provide the best effective variable depending on the results desired. Thus it would be obvious in the optimization process to optimize the distillation step and the molar ratio, particularly since Kummer et al. teaches a continuous reaction and a distillation step in which the starting material is recycled to the reaction. The Applicant does not show any unusual and/or unexpected results for the limitations stated. Note that the prior art provides the same effect desired by Applicant, the preparation of alkyl alkenoates in high yield and purity for the chemical industry.

In reference to the limitation for gamma valerolactone, in which n is 2 versus 3, it is the position of the Examiner that one of ordinary skill in the art, at the time of the invention, would through routine and normal experimentation determine the appropriate carbon chain length for the lactone. Slight variations in the alkyl chain length suggest the compounds have similar properties and utilities. "Structural relationships may provide the requisite motivation or suggestion to modify known compounds to obtain

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new compounds. For example, a prior art compound may suggest its homolog because homologs often have similar properties and therefore chemists of ordinary skill would ordinarily contemplate making them to try to obtain compounds with improved properties.” (see MPEP § 2144.08c). In addition, adjacent homologues and structural isomers are generally so structurally similar that “without more” such structural similarity could give rise to prima facie obviousness (see *In re Wilder*, 563 F.2d 457, 195 USPQ 426). In the absence of unexpected results, one skilled in the art would expect that the instant claims, directed to compounds that are analogous to the compounds of Kummer et al. are prima facie obvious.

Therefore, it would be prima facie obvious to one of ordinary skill in the art at the time of the invention, to use the adjacent homolog of Kummer et al.’s lactone, which is one CH₂ group from Applicant’s gamma valerolactone. Absent any showing of unusual and/or unexpected results over Applicant’s particular lactone and alkyl alkenoate, the art obtains the same effect on the compound’s efficacy and utility. The expected result would be the effective synthesis of alkyl alkenoates for the chemical industry.

Reply to applicants remarks

In the remarks filed in on 4/24/08, applicant has argued that Kummer fails to teach continuous distillation, the appropriate molar ratio and gamma valerolactone.

The same argument is repeated in the remarks filed 11/12/08.

Continuous distillation

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Kummer teaches that the reaction of lactone and alcohol can be performed in a liquid phase. One skilled in the art would readily appreciate that the instant reaction represents a reversible process. It is well known in the art to manipulate reversible processes, such as for example esterification, by continuously removing one of the products. Therefore continuous distillation that is taught by the applicant is obvious in view of the process where no continuous distillation is taught, which the process of Kummer is.

Molar ratio

It is obvious to alter molar ratio of reagents in order to determine optimal conditions for the process. Formation of ether is a well known side reaction in the instant process. Keeping the alcohol concentration low is a known method of lowering the rate of ether formation. One skilled in the art would find the appropriate ratio of reagents through routine experimentation.

Structure of product and lactone

Kummer et al describe a process where alkene carboxylates of formula (I) are formed (column 1, lines 13-20). The compounds of formula I include alkene carboxylates that are formed from a 5 member ring lactone. Even though a 5-member ring lactone is not exemplified, one skilled in the art would find it obvious to use it to prepare the corresponding alkene carboxylates. The exclusion of one methylene group from a 6-

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member lactone is not expected to have a dramatic effect on reactivity of the said lactone.

Comparative Examples

Applicants also refer to the examples found in the instant specification.

Although the examples indicate advantageous aspects of applicants process, the results are not considered unexpected.

The low concentration of alcohol due to continuous distillation is expected to reduce the ether formation. Such result is not unexpected because a rate of bimolecular reactions such as ether formation is well known to depend on the concentration of the reagents.

Comparative example where continuous distillation is compared to a process where continuous distillation is not performed is also not considered unexpected. In applicants' process the product is being removed as it is formed while in comparative examples the product remains with all of the reagents initially added to the reaction mixture. The concentration of the product is expected to be higher once it is distilled from the reaction mixture. The result is therefore not considered unexpected.

Conclusion

Claims 1-20 are pending.

Claims 1-20 are rejected.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yevgeny Valenrod whose telephone number is 571-272-9049. The examiner can normally be reached on 8:30am-5:00pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Sullivan can be reached on 571-272-0779. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Yevgeny Valenrod/

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